

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/JP2004/010555

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 C30B11/00 C30B29/40 C30B29/42

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C30B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GAULT: "A novel application of the vertical gradient freeze method to the growth of high quality III-V crystals" JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 74, no. 3, 1986, pages 491-506, XP002121188 ISSN: 0022-0248 abstract	14, 15
X	EP 0 971 052 A (MITSUBISHI CHEM CORP) 12 January 2000 (2000-01-12) claims 1,2,8,28 ----- -/-	14, 15



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

15 October 2004

Date of mailing of the international search report

22/10/2004

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Cook, S

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/JP2004/010555

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	YABUHARA Y ET AL: "High quality InP substrates grown by the VCZ method" INDIUM PHOSPHIDE AND RELATED MATERIALS, 1996. IPRM '96., EIGHTH INTERNATIONAL CONFERENCE ON SCHWABISCH-GMUND, GERMANY 21-25 APRIL 1996, NEW YORK, NY, USA, IEEE, US, 21 April 1996 (1996-04-21), pages 35-38, XP010157617 ISBN: 0-7803-3283-0 abstract	10-13
A	YASUMASA OKADA ET AL INSTITUTE OF PHYSICS: "DISLOCATION ELIMINATION IN VERTICAL GRADIENT FREEZE GROWN GAAS SINGLE CRYSTALS" GALLIUM ARSENIDE AND RELATED COMPOUNDS. JERSEY, 24 - 27 SEPT., 1990, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON GALLIUM ARSENIDE AND RELATED COMPOUNDS. (TITLE FROM 1994 ONWARDS: PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COMPOUND SEMICONDUCTORS, vol. SYMP. 17, 24 September 1990 (1990-09-24), pages 61-66, XP000146745 figure 1	7-9
X	ASAHI T ET AL: "VGF CRYSTAL GROWTH AND VAPOR-PHASE FE DOPING TECHNOLOGIES FOR SEMI-INSULATING 100MM DIAMETER INP SUBSTRATES" 1999 11TH. INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS. CONFERENCE PROCEEDINGS. IPRM DAVOS, MAY 16 - 20, 1999, INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS, NEW YORK, NY : IEEE, US, vol. CONF. 11, 16 May 1999 (1999-05-16), pages 249-254, XP000931439 ISBN: 0-7803-5563-6 page 252	10,11
Y	YASUMASA OKADA ET AL: "MECHANISM OF A REDUCTION OF DISLOCATION DENSITIES IN VERTICAL-GRADIENT-FREEZE-GROWN GAAS SINGLE CRYSTALS" JAPANESE JOURNAL OF APPLIED PHYSICS, PUBLICATION OFFICE JAPANESE JOURNAL OF APPLIED PHYSICS. TOKYO, JP, vol. 29, no. 11 PART 2, 1 November 1990 (1990-11-01), pages L1954-L1956, XP000232823 ISSN: 0021-4922 page L1956, right-hand column, paragraph 2	1-15
	-/--	

## INTERNATIONAL SEARCH REPORT

International Application No

PC 1/JP2004/010555

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 0151, no. 77 (C-0829), 7 May 1991 (1991-05-07) & JP 3 040987 A (NIPPON TELEGR & TELEPH CORP <NTT>), 21 February 1991 (1991-02-21) cited in the application abstract	7-9, 14, 15
Y	ZEMKE D ET AL: "GROWTH OF INP BULK CRYSTALS BY VGF: A COMPARATIVE STUDY OF DISLOCATION DENSITY AND NUMERICAL STRESS ANALYSIS" PROCEEDINGS OF THE EIGHTH INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS 1996. SCHWABISCH GMUND, APR. 21 - 25, 1996, PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS (IPRM), NEW YORK, IEEE, US, vol. CONF. 8, 21 April 1996 (1996-04-21), pages 47-49, XP000634431 ISBN: 0-7803-3284-9 page 47, left-hand column, paragraphs 3,4	1-6, 10-13
A	EP 0 992 618 A (JAPAN ENERGY CORP) 12 April 2000 (2000-04-12) paragraphs '0020! - '0024! -----	1-15

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP2004/010555

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0971052	A	12-01-2000	DE 69914540 D1	11-03-2004
			EP 0971052 A1	12-01-2000
			JP 2000086398 A	28-03-2000
			US 6325849 B1	04-12-2001
<hr/>				
JP 3040987	A	21-02-1991	NONE	
<hr/>				
EP 0992618	A	12-04-2000	JP 11302094 A	02-11-1999
			JP 11343193 A	14-12-1999
			EP 0992618 A1	12-04-2000
			US 6334897 B1	01-01-2002
			WO 9950481 A1	07-10-1999
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# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 6914	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/JP2004/010555	International filing date ( <i>day/month/year</i> ) 16 July 2004 (16.07.2004)	Priority date ( <i>day/month/year</i> ) 17 July 2003 (17.07.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant SHOWA DENKO K.K.			

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 <i>bis</i> .1(a).																								
2.	This REPORT consists of a total of 6 sheets, including this cover sheet.  In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input checked="" type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																							
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<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																							
<input type="checkbox"/>	Box No. IV	Lack of unity of invention																							
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																							
<input type="checkbox"/>	Box No. VI	Certain documents cited																							
<input type="checkbox"/>	Box No. VII	Certain defects in the international application																							
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 740 14 35</p>	<p>Date of issuance of this report 23 January 2006 (23.01.2006)</p> <hr/> <p>Authorized officer</p> <p style="text-align: center; font-weight: bold;">Masashi Honda</p> <p>Telephone No. +41 22 338 70 10</p>
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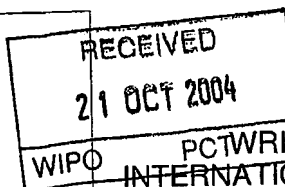
# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

see form PCT/ISA/220



PCTWRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/010555

International filing date (day/month/year)  
16.07.2004

Priority date (day/month/year)  
17.07.2003

International Patent Classification (IPC) or both national classification and IPC  
C30B11/00, C30B29/40, C30B29/42

Applicant  
SHOWA DENKO K.K.

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016

Authorized Officer

Cook, S

Telephone No. +31 70 340-3372



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/010555

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/010555

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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-9
	No: Claims	10-15
Inventive step (IS)	Yes: Claims	
	No: Claims	1-15
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations

**see separate sheet**



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP2004/010555

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: YABUHARA Y ET AL: "High quality InP substrates grown by the VCZ method" INDIUM PHOSPHIDE AND RELATED MATERIALS, 1996. IPRM '96., EIGHTH INTERNATIONAL CONFERENCE ON SCHWABISCH-GMUND, GERMANY 21-25 APRIL 1996, NEW YORK, NY, USA, IEEE, US, 21 April 1996 (1996-04-21), pages 35-38, XP010157617 ISBN: 0-7803-3283-0**
- D2: ASAHIT ET AL: "VGF CRYSTAL GROWTH AND VAPOR-PHASE FE DOPING TECHNOLOGIES FOR SEMI-INSULATING 100MM DIAMETER INP SUBSTRATES" 1999 11TH. INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS. CONFERENCE PROCEEDINGS. IPRM DAVOS, MAY 16 - 20, 1999, INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS, NEW YORK, NY : IEEE, US, vol. CONF. 11, 16 May 1999 (1999-05-16), pages 249-254, XP000931439 ISBN: 0-7803-5563-6**
- D3: GAULT: "A novel application of the vertical gradient freeze method to the growth of high quality III-V crystals" JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 74, no. 3, 1986, pages 491-506, XP002121188 ISSN: 0022-0248**
- D4: YASUMASA OKADA ET AL: "MECHANISM OF A REDUCTION OF DISLOCATION DENSITIES IN VERTICAL-GRADIENT-FREEZE-GROWN GAAS SINGLE CRYSTALS" JAPANESE JOURNAL OF APPLIED PHYSICS, PUBLICATION OFFICE JAPANESE JOURNAL OF APPLIED PHYSICS. TOKYO, JP, vol. 29, no. 11 PART 2, 1 November 1990 (1990-11-01), pages L1954-L1956, XP000232823 ISSN: 0021-4922**
- D5: ZEMKE D ET AL: "GROWTH OF INP BULK CRYSTALS BY VGF: A COMPARATIVE STUDY OF DISLOCATION DENSITY AND NUMERICAL STRESS ANALYSIS" PROCEEDINGS OF THE EIGHTH INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS 1996. SCHWABISCH GMUND, APR. 21 - 25, 1996, PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS (IPRM), NEW YORK, IEEE, US, vol. CONF. 8, 21 April 1996 (1996-04-21), pages 47-49, XP000634431 ISBN: 0-7803-3284-9**

**Novelty**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 10-15 is not new in the sense of Article 33(2) PCT.

The products of claims 10-15 are taught in the prior art. D1 teaches S-doped InP single crystals with a dislocation density less than  $500 \text{ cm}^{-2}$  (see abstract).

D2 teaches undoped and Fe doped InP single crystals with average dislocation densities as low as  $2000 \text{ cm}^{-2}$  (see page 252).

D3 teaches Si-doped GaAs single crystals with dislocation densities lower than  $300 \text{ cm}^{-2}$  (see abstract).

### ***Inventive Step***

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-15 does not involve an inventive step in the sense of Article 33(3) PCT.

The problem addressed by the application is the one of producing single crystals of InP and GaAs with average dislocation densities below a given level. The solution proposed in independent claims 1, 4 and 7 is to grow these crystals from the melt using a seed with a given dislocation density and a cross-sectional size and shape equal of that of the crystal to be grown. It is well known to the skilled person that the quality of a seed crystal (e.g. dislocation density) will influence the quality of the crystal to be grown therefrom. Reference is made, for example, to the very last paragraph of D4 which describes this expectation of the skilled person in relation to GaAs produced by the VGF method. The twinning problem encountered in growing crystals to a larger diameter than the seed used is also well known to the skilled person. D5, for example, describes this problem in relation to InP single crystals and informs the skilled person that the best way of overcoming the problem is to use a flat bottomed crucible with a seed the same cross-sectional size as the crystal to be grown (see fig.1 and left hand column on page 47). The independent method claims, along with their dependent claims of the present application, do not contain any technical features amounting to an inventive step when considered in the light of the skilled person's knowledge of the prior art.

### ***Industrial applicability***

The claimed subject matter is considered to be industrially applicable and thus fulfilling the requirements of Article 33(4) PCT.

10/560382

(12)特許協力条約に基づいて公開された国際出願

(19) 世界知的所有権機関  
国際事務局



(43) 国際公開日  
2004 年 8 月 19 日 (19.08.2004)

PCT

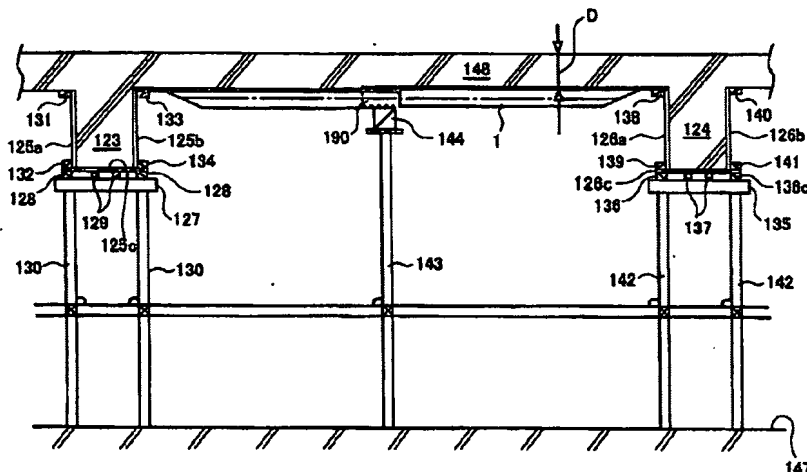
(10) 国際公開番号  
WO 2004/070137 A1

- (51) 国際特許分類<sup>7</sup>: E04G 11/50, 9/00  
(21) 国際出願番号: PCT/JP2004/001055  
(22) 国際出願日: 2004 年 2 月 3 日 (03.02.2004)  
(25) 国際出願の言語: 日本語  
(26) 国際公開の言語: 日本語  
(30) 優先権データ:  
特願2003-028426 2003 年 2 月 5 日 (05.02.2003) JP  
特願2004-007331 2004 年 1 月 14 日 (14.01.2004) JP  
特願2004-006719 2004 年 1 月 14 日 (14.01.2004) JP  
(71) 出願人 (米国を除く全ての指定国について): 有限会社柴田工務店 (SHIBATA ENGINEERING OFFICE LIMITED) [JP/JP]; 〒7410072 山口県岩国市平田 4 丁目 1 番 3 3 号 Yamaguchi (JP).  
(72) 発明者: および  
(75) 発明者/出願人 (米国についてのみ): 柴田 光雄 (SHIBATA, Mitsuo) [JP/JP]; 〒7400017 山口県岩国市今津町 4 丁目 3 番 2 1 号 Yamaguchi (JP).  
(74) 代理人: 飯塚 信市 (IIZUKA, Shin-ichi); 〒1600022 東京都新宿区新宿一丁目 1 番 1 3 号 慶應堂御苑ビル 4 階 飯塚国際特許事務所 Tokyo (JP).  
(81) 指定国 (表示のない限り、全ての種類の国内保護が可能): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU,

[続表有]

(54) Title: CONSTRUCTION METHOD FOR STRUCTURE

(54) 発明の名称: 構造物の施工方法



(57) Abstract: A construction method for structure capable of constructing ceiling slabs and floor slabs without providing cross sectional damage to ceiling beams and floor beams and repeatedly recycling mold frames used for the construction, comprising the steps of preparing a specified quantity of length-adjustable mold frame materials for forming flat surface, hanging the mold frame materials, adjacently to each other by a specified quantity, across the opposed upper edge parts of the two mold frames for beam formation horizontally separated from each other after the lengths of the mold frame materials for forming the flat surface and adjusted so that the tips of the mold frame materials are not extruded to the molding material filling spaces of the mold frames for beam formation to construct a floor surface for flowing the forming material, flowing the forming material to the floor surface for flowing the forming material to a thickness required for the slab, waiting until the forming material is solidified, disassembling the mold frames for beam formation, and separating the mold frames for forming the flat surface from a molded body and collecting the mold frames.

(57) 要約: 天井梁や床梁に断面欠損を与えることなく、天井スラブや床スラブを施工することができ、しかも施工に使用した型枠を繰り返し再利用することができる、構造物の施工方法である。長さ調整可能な平坦面成形用型枠材を所要枚数だけ用意し、これを水平方向へと離間された 2 つの梁成形用型枠の対向する上縁部と上縁部との間に、各平坦面成形用型枠材の先端が梁成形用型枠

[続表有]

WO 2004/070137 A1